

CURRENT SUPPORT BRIEF

OUTLOOK FOR COMMUNIST CHINA'S IRON AND STEEL INDUSTRY

OFFICE OF RESEARCH AND REPORTS

CENTRAL INTELLIGENCE AGENCY

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OUTLOOK FOR COMMUNIST CHINA'S IRON AND STEEL INDUSTRY

Communist China's steel industry, which as recently as 1955 produced only 2.85 million metric tons of steel, expects to turn out 18.4 million tons in 1960 and may well be producing at a rate in excess of 35 million tons a year in 1965. To reach this level in 1965, the Chinese will have to add little more steelmaking capacity during 1960-65 than was installed in 1955-60--about 3.4 million tons a year as against 3.1 million tons. Additions to capacity arising from the installation of Soviet and European Satellite equipment will be about the same as in 1955-60. Steel production in China in 1943, the pre-Communist peak, and in selected past and future years, is estimated as follows:

	<u>Metric Tons</u>
1943	923,000
1950	605,000
1955	2,853,000
1957	5,350,000
1958	8,000,000*
1959	13,350,000**
1960	18,400,000
1965	35,500,000

*Excludes "native" furnace production; includes some side-blown converter output.

**Includes 4.7 million tons from side-blown converters.

These impressive increases in steel output are being achieved by following a policy described by the Chinese as "walking on two legs." To the Chinese this means building domestically-improvised facilities to supplement the large, integrated plants being constructed, modernized and expanded with the assistance of the Soviet Union. The general characteristics of China's industry in 1965 may be approximately as shown in the following grouping:

Production Capacity in 1965

(Million Metric Tons)

Major Soviet-sponsored
and-equipped projects

Anshan	6.0	Expanded from 1.3 million ton Japanese-built plant. Open hearth.
Wuhan	3.0	Fully integrated open hearth, near Tayeh iron ore. First steel, 1959.

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Production in Capacity in 1965 (Continued)

(Million Metric Tons)

Major Soviet-sponsored
and-equipped projects

Paotou	3.0	Fully integrated open hearth, near Paiyunopo iron ore. First steel, 1960.
Tsitsihar	.5	Special steel plant--electric and open hearth.
Total	12.5	

Plants being enlarged
and integrated with
Soviet and European
Satellite assistance

Tayeh	1.3	Open hearth and electric. Being expanded with East German aid.
Taiyuan	2.0	Open hearth and electric --converters added in 1959. East German blooming and Soviet rolling mill.
Maanshan	1.0	Converters and Chinese rolling mills added.
Chungking	1.5	Open hearth. Converters and Czechoslovakian rolling mills added.
Shihchingshan	1.3	Converters and Soviet pipe mill added.
Hsiangtan	1.2	Converters and Chinese blast furnaces added.
Total	8.3	

Partially Integrated
Plants

Dairen	.1	Electric furnaces.
Mukden	.3	Open hearth and electric furnaces.
Fushun	.7	Electric furnace, being expanded.
Penchi	.1	Electric furnace; produces 2 million tons of pig iron.
Total	1.2	

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CONFIDENTIALProduction Capacity in 1965 (continued)

(Million Metric Tons)

Integrated Plants being
constructed with
Chinese produced
equipment

Chiuchuan	1.5	Near Chingtiehshan iron ore in Kansu Province.
Hsichang	2.0	Will use iron ore from Panchihhua.
Lungyen	1.5	Local high grade iron ore.
Shaokuan	1.5	First large plant in southeastern China; will draw on scattered high grade iron ore deposits in Kwangtung and Fukien Provinces.

Total	6.5	
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Local small and medium
"modern" plants

7.0	30 to 100 small and medium plants. 4 million tons of side blown converter capacity installed up to September 1959.
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Total	7.0
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Grand Total	35.5
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The total of 35.5 million tons of steel production in 1965 derived from the above compilation may well be exceeded. Goals for 1965 have not yet been announced if in fact they have been officially determined. A continuation during the 1960-65 period of the 1959-60 rate of expansion of the home-style sector of the industry would raise output considerably above 35.5 million tons in 1965.

Facilities comprising the home-style sector of the Chinese industry are described by the Chinese as small-and medium-sized "modern" to distinguish them from the small "native"-type facilities now largely abandoned. The current "modern" plant in its simplest form consists of blast furnaces ranging from 6.5 to 28 cu.m. in volume, side-blown converters of from 1/2 to 6 tons capacity per blow, and such rolling mills as can be provided. The outstanding feature of these "modern" facilities is that in their construction, China has standardized the side-blown converter as the steelmaking unit. Basic lined, these converters

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are similar to the "turbo hearth" converters developed in the United States during the 1940s. For China, these converters have two distinct advantages: they require only a small investment of capital and, if given competent control, they are capable of producing steel of a quality acceptable for general use.

The practical size limitation of approximately six tons per blow presents little disadvantage in plants using side-blown converters. Blast furnaces are largely built of local stone, brick and clay; metal parts are fabricated locally to the extent that facilities are available. Rolling mills vary greatly in design and range from improvisations turned out by local blacksmiths to more conventional equipment produced in foundries and machine shops attached to manufacturing plants, shipyards, or wherever the necessary tooling can be assembled.

The Chinese are installing side-blown converters in existing plants of otherwise standard design as well as in the "modern" plants being constructed by the hsien and communes. Over one million tons of such capacity has been provided in the Shanghai area alone in rolling mills that formerly lacked steel producing facilities. There is room for improvement in operating practice, however, since only 48.5 percent of converter steel production in the Shanghai area in March, 1960, was "first class." 1/ Nevertheless this material is absorbed into the economy for one use or another.

The concept of the "modern" plant incorporating the side-blown converter arose from the realization by the Chinese Communists during the period of the First Five-Year Plan (1953-57) that the large, integrated, steel complexes then being constructed and embodying the latest Soviet technology could not be completed with sufficient rapidity. Large tonnages of steel were needed at once both for the forced industrialization program and for tools and implements to bolster agricultural production. Further, the high capital cost of modern production facilities and the requirement for repayment in exports not only placed a limitation on the rate of expansion but also failed to take advantage of the country's principal natural resource--the availability of abundant, low cost labor. The relative economic value of capital and labor in Communist China is strikingly illustrated by the following extract from an article published in a Chinese magazine in 1955:

"The per capita equipment of the workmen in our country in terms of fixed assets is assessed at an average of 4,000 to 5,000 yuan; in the case of modernized, big industry, it is around 10,000 yuan, while in medium and small industrial undertakings where light machines are used, each workman is equipped to the extent of 2,000 to 3,000 yuan. The average value produced by each workman annually is 14,000 to 15,000 yuan in modernized, big industry, or 7,000 to 8,000 yuan in medium and small industry. However, as in big industry the capital of 10,000 yuan is just enough to equip one workman and in medium and small industry the same amount can equip three to five workmen, every 10,000 yuan of fixed assets in modernized big industry nets 14,000 to 15,000 yuan in terms of values produced annually, whereas the same amount of fixed assets in medium and small industry nets 20,000 to 30,000 yuan annually in terms of values produced." 2/

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The employment of millions of workers stoking and tending hundreds of thousands of "native" furnaces as part of the "Great Leap Forward" orgy in 1958 represented the implementation of this philosophy ad absurdum. The "native" furnace campaign was abandoned, not because it was considered wasteful of labor and materials, but because it failed to contribute a product useful to the national economy.

Although the "modern", homespun type of steel-producing facility will probably remain in operation for many years to supply local needs, Chinese Communist plans envisage the eventual evolution of this sector of the industry to units, constructed from domestic resources, which would come closer to being "modern" in the Western sense. Construction has begun on four large integrated iron and steel complexes in widely dispersed locations in the vicinity of major deposits of iron ore and coking coal. Although the steelmaking departments of these plants will probably initially be built around side blown converters, other facilities will be of more conventional design manufactured in domestic heavy machinery enterprises.

Chinese Communist capabilities in the manufacture of more sophisticated types of iron and steelmaking and processing equipment are increasing. The Soviet-aided expansion of the heavy machinery plants at Mukden and Taiyuan and the construction of the new Soviet-designed and equipped plant at Fularki are scheduled for completion in 1962. These facilities, now in partial operation, are being equipped to manufacture up-to-date, highly productive, Soviet-designed iron and steel plant components.

Supplies of the principal raw materials--iron ore and coal--appear to present no problems to the expansion of China's steel industry, other than those associated with their extraction and preparation. The Deputy Minister of Geology in October 1959 claimed "verified" reserves of iron ore of over 10,000 million tons. 3/ Reserves of coal are estimated at 1,000,000 million tons. Furthermore, iron ore and coal occur in substantially all of the 25 provinces in the country. Chinese iron-making facilities are all said to be located conveniently to deposits of iron ore and coal adequate for their uses for many years. This claim appears to be generally supported by the facts, although problems of quality will become increasingly apparent as progress is made in increasing the efficiency of the industry.

At 35 million tons, China's output in 1965 will top West Germany's production of 29.4 million tons in 1959--the third largest in the world in that year. But China's production would continue to be far from adequate in relation to the requirements generated by the progressive industrialization of China's primitive, subsistence economy, and by the expansion of transportation facilities, irrigation, and the semi-mechanization of agriculture. At 35 million tons, China's production would provide only 45 kilograms of steel per capita--less than one-tenth of West German or US consumption in 1959. However, in the context of the Communist system of rigid allocations of available supplies for purposes dictated by the Party's domestic and foreign policy objectives, the Chinese Communist accomplishment has formidable implications.

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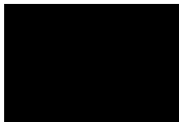
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Sources :

1.
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The Far East. U.

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